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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/709,625	05/18/2004	Adrian Snell	78.1177	3624

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EXAMINER	
FULLER, ROBERT EDWARD	

ART UNIT	PAPER NUMBER
3672	

DATE MAILED: 04/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/709,625	SNELL ET AL.	
	Examiner	Art Unit	
	Robert E. Fuller	3672	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-106* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-106* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 May 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *08/22/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: 100. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 68. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If

the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

3. The abstract of the disclosure is objected to because it is not in narrative form. The abstract has been drafted as one long run-on sentence, much like a claim. The abstract should be narrative and consist of a series of complete sentences forming a single paragraph. Correction is required. See MPEP § 608.01(b).

4. Applicant is reminded of the proper content of an abstract of the disclosure.

A patent abstract is a concise statement of the technical disclosure of the patent and should include that which is new in the art to which the invention pertains. If the patent is of a basic nature, the entire technical disclosure may be new in the art, and the abstract should be directed to the entire disclosure. If the patent is in the nature of an improvement in an old apparatus, process, product, or composition, the abstract should include the technical disclosure of the improvement. In certain patents, particularly those for compounds and compositions, wherein the process for making and/or the use thereof are not obvious, the abstract should set forth a process for making and/or use thereof. If the new technical disclosure involves modifications or alternatives, the abstract should mention by way of example the preferred modification or alternative.

The abstract should not refer to purported merits or speculative applications of the invention and should not compare the invention with the prior art.

Where applicable, the abstract should include the following:

(1) if a machine or apparatus, its organization and operation;

(2) if an article, its method of making;

(3) if a chemical compound, its identity and use;

(4) if a mixture, its ingredients;

(5) if a process, the steps.

Extensive mechanical and design details of apparatus should not be given.

5. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. The title is not commensurate with the claimed invention because the title does not mention the method of using the device.

The following title is suggested: Equipment housing for Downhole Measurements and Method.

Claim Objections

6. Claims 20, 21, 49, 50, 75, 76, 101, and 102 are objected to because of the following informalities: The claims should be constructed as Markush claims. For example, with regard to claim 20, the following change is suggested: --The apparatus of claim 2, wherein said at least one sensor is selected from the group consisting of a thermometer, a gyroscope, an accelerometer, a strain gauge, a barometer, a pressure sensor and a hall effect switch.-- Appropriate correction is required.

7. Claims 101 and 102 are further objected to because of the following informalities: With regard to claim 101, "said at least one sensor" lacks antecedent basis. With regard to claim 102, "said at least one electrical component" lacks antecedent basis.

For purposes of examination, it will be assumed that claims 101 and 102 depend from claims 87 and 88, respectively. Appropriate correction is required.

8. Claims 24, 53, and 79 are objected to because of the following informalities: It is unclear whether "a cavity" refers to the cavity of the independent claim, or if it refers to a second cavity. Appropriate correction is required.

9. Claims 103-106 are objected to because of the following informalities: Claims 103 and 104 are method claims depending from claim 85, which is an apparatus claim. Consequently, claims 105 and 106 are also improper, as they depend from claims 103 and 104, respectively. For purposes of examination, claims 103 and 104 will be treated as if they depend from claim 86. Appropriate correction is required.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. Claims 1, 2, 5-11, 14, 16, 18-20, 22, 23, 26-32, 35-40, 43, 45, 47-49, 51, 52, 55-61, 64-66, 69, 71, 73-75, 77, 78, 81-87, 90-96, 99-101, and 103-106 are rejected under 35 U.S.C. 102(b) as being anticipated by Hay (US 5,973,317).

With regard to claims 1, 5, 7, 31, 60, 86, and 90, Hay discloses a housing having fiber optic sensors embedded within the housing for measuring loads in a drill string. Hay's device has the following features:

a. A first component (14) adapted to be positioned in a subterranean hole;

b. A second component (12) adapted to be positioned in said subterranean hole;

c. A detachable housing (16), at least a portion of which is clamped between said first and second components, said housing having at least one cavity (32) formed therein, and at least one device (22) positioned within said at least one cavity.

d. The first and second components are threadingly connected (with regard to claims 5, 31, and 90 – See figure 2)

e. There is nothing precluding the second component of Hay's device from being a drill bit (with regard to claims 7, 36, 60, and 91)

f. The method of using Hay's device includes all of the steps of claim 86.

With regard to claims 2, 32, 61, and 87, the device (22) of Hay is comprised of a fiber optic sensor (column 2, line 29).

With regard to claims 6, 35, and 91, the first component of Hay's device is a threaded pipe (figure 2).

With regard to claims 8, 37, and 93, the first and second components of Hay's device are sections of pipe (figure 2).

With regard to claims 9, 38, 64, and 94, Hay teaches that an end surface of the first component and an end surface of the second component engage the housing (figure 2).

With regard to claims 10, 39, 65, and 95, the housing of Hay's device has a plurality of cavities formed therein (figure 3a).

With regard to claims 11, 40, 66, and 96, Hay teaches that a fiber optic sensor is positioned within each of the cavities formed within the housing (column 2, line 29).

With regard to claims 14, 43, and 69, the housing is positioned adjacent to an exterior surface of the first component, i.e. the end surface (figure 2).

With regard to claims 16, 45, 71, and 99, the cavities of Hay's device have a cylindrical configuration (figure 3a).

With regard to claims 18, 47, and 73, Hay's device contains a passageway connecting one of the cavities to the outer surface of the housing, which provides a connection for the fiber optic cable (40).

With regard to claims 19, 48, 74, and 100, the cavities of Hay's device are interconnected (figure 3a).

With regard to claims 20, 49, 75, and 101, the fiber optic sensor of Hay's device is a strain gauge.

With regard to claims 22, 51, and 77, Hay's device has an attachment lip which can be clamped between the first and second components.

With regard to claim 23, 52, and 78, Hay's housing is configured as a ring.

With regard to claims 26, 55, and 81, Hay teaches that the end surface of the first component is positioned over the cavities and is sealingly engaged with a surface of the housing.

With regard to claims 27-30, 56-59, 82-85, and 103-106, the housing of Hay's device is coupled to optical signal processing equipment (52) for signal "analysis" (column 5, line 35). In order for analysis to occur, the optical processing equipment

would inherently have to provide some sort of visual feedback to the operator via a display. This visual feedback would include indicator lights and display panels. Furthermore, the indicator light and the display panel would be indirectly coupled to the exterior of the housing via the fiber optic cable running from the housing to the optical processing equipment.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

13. Claims 3, 4, 21, 33, 34, 50, 62, 63, 76, 88, 89, and 102 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hay in view of LoGiudice (US 2004/0256113).

Hay discloses all of the limitations of the above claims, except for the device within the cavity being comprised of an electrical component in addition to a sensor, where the electrical component is either a battery, a microprocessor, a wireless

transmitter, a wireless receiver, a circuit board, an analog-to-digital converter, a communications port, or a memory chip.

LoGiudice discloses a device for remotely actuating a downhole tool. A battery—the electrical component (360)—and sensors (355) are located within a collar fixedly attached to the tubing string (figures 3 and 4).

It would have been considered obvious to one of ordinary skill in the art, at the time the invention was made, to have modified the device of Hay to include the battery of LoGiudice within the cavities, in order to have provided a remote power source.

14. Claims 15, 44, and 70 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hay in view of Hall (US 2004/0104797).

Hay discloses all of the limitations of the above claims, except for the housing being positioned adjacent to an interior surface of the first component.

Hall discloses a device for transmitting data through a drill string using a series of electromagnetic couplers. The couplers (figure 3A, items 37A and 35A) are located at the joints of the pipes along the inside surface of the inner bore.

It would have been considered obvious to one of ordinary skill in the art, at the time the invention was made, to have modified the device of Hay so that the housing containing the fiber optic sensors was located along the inner surface of the first component, in order to have provided a way of shielding the sensors from the harsh environment outside of the drill string.

15. Claims 12, 13, 17, 24, 25, 41, 42, 46, 53, 54, 67, 68, 72, 79, 80, 97, and 98 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hay in view of Moake (US 2004/0200274).

With regard to claims 12, 13, 41, 42, 67, 68, 97, and 98, Hay discloses all of the limitations of the above claims, except for an electrical component and a sensor being placed in each of the plurality of cavities.

Moake discloses a device for measuring density within a subterranean wellbore, through the use of gamma ray emitters (electrical components) and detectors (sensors). The electrical components and sensors are located within projections (304) on the body of Moake's device. Figure 3 shows the electrical components and sensors being located on only one of the projections of Moake's device.

It would have been considered obvious to one of ordinary skill in the art, at the time the invention was made, to have modified the device of Hay (which already includes sensors) to include the electrical components of Moake, in order to have reduced the attenuation of the light signal by providing the light source at a location close to the sensor itself. Furthermore, it would have been considered obvious to have modified Moake's device so that the electrical components and sensors were provided on all of the projections, in order to have provided a means of measuring density in more than one direction.

With regard to claims 17, 46, and 72, Hay discloses all of the limitations of the above claims, except for a cover plate covering the cavity.

Moake discloses a device for measuring density within a subterranean wellbore, through the use of gamma ray emitters and detectors. The sensors and emitters are located within projections (304) on the body of Moake's device. The sensors and emitters are behind windows (306, 308, 310) located on the face of the projections.

It would have been considered obvious to one of ordinary skill in the art, at the time the invention was made, to have modified the device of Hay to include the windows of Moake, in order to have provided extra protection for the sensitive and fragile fiber optic instruments, and in order to have provided a means for visually inspecting the integrity of the optical fibers.

With regard to claims 24, 25, 53, 54, 79, and 80, Hay discloses all of the limitations of the above claims, except for the housing comprising a plurality of projections, each of the projections having a cavity formed therein, and at least one device positioned in each of the cavities.

Moake discloses a device for measuring density within a subterranean wellbore, using gamma ray emission sensors. The sensors are located within projections (304) on the body of Moake's device. Figure 3 shows the sensors being located on only one of the projections of Moake's device.

It would have been considered obvious to one of ordinary skill in the art, to have modified the device of Hay to include the projections of Moake, in order to have provided a means of centralizing and stabilizing the drill bit, as well as to have provided more physical space needed for larger sensors. Furthermore, it would have been considered obvious to have modified the device of Moake so that the sensors were

located within all of the projections, in order to have provided a means of measuring density in more than one direction.

Conclusion

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following references further teach the state of the art with regard to downhole sensor housings.

US 2003/0192689 – Moake et al.

US 2002/0185273 – Aronstam et al.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert E. Fuller whose telephone number is 571-272-0419. The examiner can normally be reached Monday thru Friday from 8:00 AM - 5:30 PM. The examiner is normally out of the office every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David J. Bagnell can be reached on 571-272-6999. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

03/29/06
REF

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